

# Where and When do Students do Their Most Important Learning?

- In the lab
- With their peers
- With their TAs
- In the classroom
- At home

# In the lab - pros

- The “best” environment to collaborate and engage
  - must prepare, perform, report on each experiment, thus many hours invested by each student
- Students open up to TAs, perhaps moreso than to instructors

# Groupwork in the Lab

- Groups of 3-5 possible, no leader required, TA collects and displays data; data is then shared by email
- Students learn to express their views to their peers

# In-lab assignments

- Done in groups, related to the current experiment
- Designed to keep students on track at critical times during the experiment
- Fills in time gaps in long labs e.g. during a reflux
- “Just in time” teaching

# In the lab - cons

- Expensive, difficult to expand or to make substantial changes, or to make labs relevant
- Cookbooks needed in first year, other techniques only appropriate in upper years
- Lab intros are important, but not always well done
- Answers to questions are not anonymous (unlike clicker questions in a classroom)
- Too much material available online – deters thinking
- Should we teach labs at all?

# In the classroom - cons

- Need to take notes, little time to digest material or relate it to anything real
- Large classes make it difficult to ask questions
- Should we change the lectures to synchronize with the labs?
- Should we teach lectures at all?

# On Campus

- Need more meeting spaces, hotspots for students – they learn a lot from their peers in such situations.

# At home

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